

Availability analysis of predictive hybrid M-out-of-N systems

ABSTRACT

In m-out-of-n system, if m-out-of-n modules agree, system can report consensus; otherwise, the system fails. On the other hand, in predictive hybrid system if there is no agreement, a history record of previous successful result(s) is used to predict the output. In order to analyze the availability of predictive hybrid redundancy system, Markov modeling is utilized. By using Markov model of the system in steady state, the availability is derived and compared with m-out-of-n system. The results of simulation demonstrated that the availability of predictive hybrid system is higher than m-out-of-n system especially for large m.

Keyword: Fault-tolerant system; Redundancy; M-out-of-n system; Voting